

# Information Literacy and Digital Learning

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## Abstract

Information literacy is a crucial factor in renewing our educational programmes. Gradually, the educational process is changing from prescribed learning paths and materials to situations that appeal to the creativity of students. We have developed an online Information Literacy training for students. This paper presents the first results of this training.

**Keywords:** Information literacy, online learning, educational innovation

## 1 Introduction

The exponential growth of information and the rapid developments in Information and Communication Technologies (ICT) have affected academic education tremendously. Firstly, students nowadays will have to learn to deal with the huge amount of scientific information available that is available to them. The Internet plays an important role by opening up all of this information. It gives access to large numbers of digital documents and electronic journals and to the directories of journals that are available in print only. Academic libraries are transforming from traditional, physical places into automated, virtual places. Secondly, universities are creating digital learning environments to improve upon the efficiency and quality of their educational processes and to offer education in a flexible manner. Most traditional campus-based universities now opt for educational environments in which face-to-face educational formats are combined with online learning activities.

These developments are having a major impact on the training that libraries provide in Information Literacy. Not only will they have to find ways to assist students in learning how to handle digital information and the digital tools to find this information, they will also have to offer this support in an online format.

The general idea underlying information literacy training is that students have to be trained to make the best use of the information that is available to the Erasmus University community, either in printed or in digital form, in a way that will benefit their studies and help them understand how scholarly information is structured. Over the past decades, students in most fields were told what to read. They depended upon course materials, lecture notes, handbooks and study materials prescribed by their professors.

When we started to think about the use of ICT in education several years ago, we had to come up with a way to introduce ICT into our educational processes, but also to reconsider the educational programmes themselves. The overall idea was to increase the focus on academic skills, such as research methodology, critical thinking, argumentation and communication. In addition, students were supposed to become more independent and inventive in solving questions and problems put to them by their professors. To do this, they would have to learn to find their way in information resources.

Our plan was divided into four projects:

1. renewing educational concepts;
2. developing a digital learning environment with workstations on campus;
3. restyling the web of Erasmus University, and
4. creating a digital library.

The last project focuses entirely on making content available in the digital learning environment and on teaching students to find their way. This project, for which funds to the amount of € 1.000.000 were made available, is conducted by the University Library.

The plan is based on two assumptions about the use of ICT in education:

1. ICT is to be used only if it provides additional value to the educational process;
2. Erasmus University considers personal contact with its students, as well as co-operation, personal supervision and coaching to be key elements. ICT is to be used as an aid.

## 2 The place of Information Literacy in the curricula

At present, University Libraries are facilitating the educational process itself and integrating digital information into learning environments. In this light, information literacy in the broadest sense is considered to be a basic requirement for academic cultivation and education in which the skills mentioned above are stressed: research methodology, critical thinking, argumentation and communication.

The concept of information literacy is based on three aspects:

1. Learning students about the information resources relevant to their subjects;
2. Learning students how to conduct a search and evaluate the results;
3. Personal information management.

From the point of view of the libraries, these elements are essential in teaching students how to handle information.

The idea underlying the development of online training in Information Literacy is that this training should not be organized as a separate, independent course in the curriculum. Instead, it should become an integral part of the course programmes of the various departments. That way, students will be motivated to spend time on the training because they will perceive the relevance of Information Literacy to their studies.

We consider the following requirements to be essential for the successful implementation of information literacy training in the educational programmes:

1. the content of the training, that is to say the examples and assignments, must be relevant to the subjects the students are dealing with in that particular stage of the curriculum;
2. the result of the assignments must be applicable in the next stage of their studies, for instance in writing a report, organizing a seminar, writing a thesis;
3. students must be allowed to earn credit points for the course. In some cases, information literacy will be part of a larger complex for which students may earn additional credit points.

Those requirements are of vital importance in order to motivate students.

The integration of Information Literacy into a course programme depends upon intensive communication between librarians and deans, programme directors, professors and students.

The following issues will have to be addressed:

1. What is the importance of training in Information Literacy?
2. In which part of the curriculum could this training be integrated? Examples include those courses for which students have to write scientific reports or conduct research.
3. Which assignments could be used as part of the training? Preferably, these assignments should form an integral part of a course, to allow students to earn (partial) credit points.
4. How should the assessment of this training be organized?

In the faculty of Social Sciences, the Information Literacy training has been integrated in the curricula of Public Administration and Psychology. In Public Administration, the

training is offered prior to a course on conducting research. The assignments given as part of the training are assignments in the field of Public Administration, but they are not part of the research that students have to set up and conduct. In Psychology, the assignments given as part of the training are, indeed, part of the assignments for a Psychology course, in this case for a course on conducting desk research.

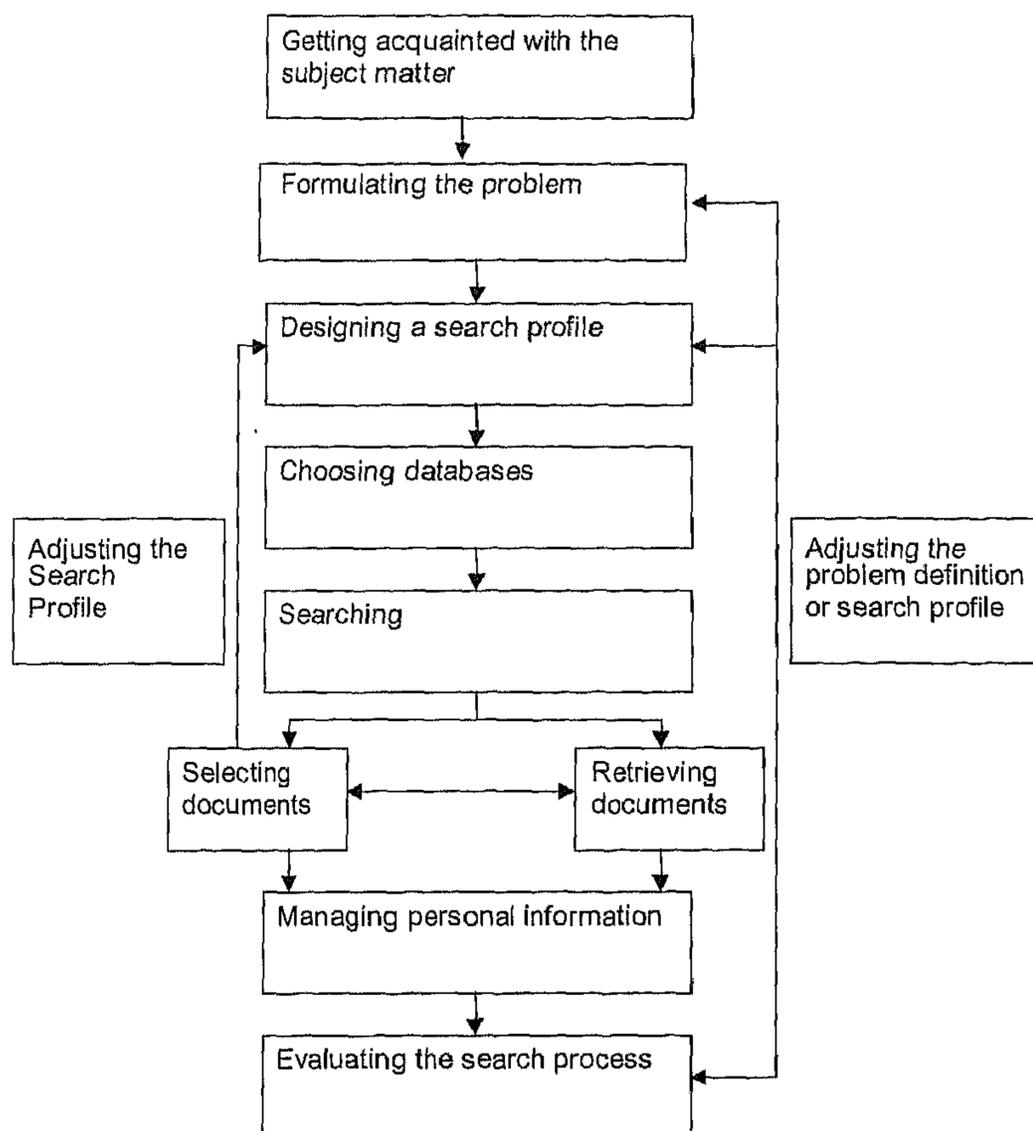
As mentioned above, at Erasmus University we consider face-to-face education to be essential to the successful use of the digital learning environment. The question is what to teach the students in those lectures. As most students are well trained in searching the Internet and regard Google as the ultimate search engine, it is difficult to make them understand that the field under discussion cannot be searched by means of Google, that the content is of high quality and that the structure of the information environment in question is complicated. Many resources, each with their own content, format, structure, interface and search tools, are very difficult to search. That's why we have called our lecture 'Information Chaos'. The meeting is dedicated almost entirely to making the students enthusiastic about the subject by getting them to understand how little they know about this area of information, that the subject is very complicated, yet very interesting and that it will be most beneficial to the rest of their studies.

### 3 Description of the online training

The training is made available through Blackboard, the standard course management system of Erasmus University. The training is available 24 hours a day. After students have followed the training, the Blackboard module will still be available for reference for the remainder of their studies.

The structure of the training is based on a general scheme for searching information (see picture 1).

The training consists of many learning elements, such as texts with examples, assignments to search databases, and Internet tools and quizzes. An interesting learning element is the interactive assignment. Within the training, several types of interactive assignments are available. For example, one is geared to the practical use of actual databases that are available on the Internet. In addition to an assignment using the catalogue of the EUR library, assignments teaching the students how to use databases such as Sociological Abstract, PsycINFO, Social Science Citation Index (SSCI) and Sdu Opmaat (in Dutch), are included in the training as well. A second group of interactive assignments focuses on the use of topic lists (e.g. Sociosite and Sosig) or on the use of general search tools on the Internet (e.g. Google and AltaVista). A third group of assignments is about creating search profiles.



Picture 1. Flow chart for searching information

Finally, the training includes quizzes to assess the students' level of Information Literacy and their ability to use the citation standards in practice.

The training is divided into seven parts.

1. *Introduction*

2. *Search profile.* This part focuses on transforming an information request or problem into a search profile. After familiarizing himself with the topic selected, the student formulates an information request or problem. He then sets up a search profile by breaking the information request down into smaller elements, by selecting the appropriate search terms and by using Boolean operators to combine these elements into a search profile.

3. *Choosing databases.* This topic is about the databases that are available in a specific scientific field and how a user can decide which database to use for a particular information problem.

4. *Searching.* This part covers common search principles, such as using a search profile, the 'quick-and-dirty method', searching by means of citations, looking for recent publications and general methods for searching the Internet.

5. *Selecting and evaluating.* After having found a number of documents, the user has to choose which documents to use. This means that he will have to assess the content and quality of the documents found. Depending on the outcome of this assessment, the search profile may have to be redefined and reapplied.

6. *Retrieving documents.* In this very practical part, the student learns how he gets an actual hold of the articles or books found in his search. The implementation of this module depends to a large extent on the way in which the library of the EUR is organized.

7. *Personal information management.* An important skill at this point is learning to manage all the information that has been retrieved and selected – either in digital or in printed form – and to control the process of comparing, interpreting, integrating and representing the information. Part of this is learning how to use the citation rules that are commonly used in a particular field, for example the citation rules of the American Psychological Association (APA). Students can use the EndNote programme to manage their bibliographical data.

Two librarians developed the online training in co-operation with two educational consultants concerned with ICT in Education, and several staff members from the Faculty of Social Sciences. The effort put into developing this training was not recorded accurately and can therefore only be

estimated. The estimated time spent by the librarians and the educational consultants is listed in table 1. The efforts of the staff members from the Social Sciences department in helping to develop this training were limited and part of their normal educational activities.

Table 1. Estimate of time spent on developing the online training

Activity	Time spent by librarians	Time spent by educational consultants
Content	80	-
Design of the training	20	30
Development	100	20
Evaluation	20	10
	220	60

In all, the development of the online training is estimated to have taken 280 hours. That is a large investment in time for the library. Although the project has served to gain experience in developing online training, the investment will have been worthwhile only if the training is incorporated into several curricula of Erasmus University.

#### 4 Pilot studies

The online training has been included in two course programmes so far. In the fall of 2001, the online training was introduced in the first year of the Public Administration curriculum. About 30 students were involved. The assignment and training were given prior to a course on conducting research, but the assignment was not fully integrated in this course. Although they were expected to do the assignment, the students did not earn credit points for their work.

Based upon the experiences in the pilot, some changes were made in the online training. However, the first problem we were confronted with was that, in general, students did not know what scholarly publications were, how the quality of scientific publications is assessed, or which different types of scholarly publications exist, such as working papers, preprints, intellectual essays, dissertations, peer-reviewed articles, etc. Moreover, publications will differ between disciplines in relation to the cognitive and social structure of the field. The same holds true for other resources, such as statistical resources providing market analyses, biochemical resources, genbanks, etc. We therefore added new elements to the training explaining about different types of information resources and their specific qualities. Finally, the two quizzes and the item on APA citation standards were newly incorporated in the online training. The new version of the training was then introduced in the first year of the curriculum of Psychology in the spring of 2002, and was taken by 29 students. This time, the assignment was part of an

actual course within the curriculum, and so the students did receive a credit point for completing the assignment correctly.

After they had taken the training, the students were asked to fill out a questionnaire on the assignments and the online training. Table 2 gives the general answers to some of the evaluation questions included in these questionnaires.

According to the answers, the Psychology students spent more time to complete the assignments and to take the online training in Blackboard than the students in Public Administration (question 1). Since the assignments were completely different, however, the difference is not relevant. More relevant seems the answer to the question about the amount of time spent on the online training itself (question 2). The Psychology students reported to have spent 2 hours, while the students of Public Administration reported to have spent only 1.2 hours. But again, the difference can be accounted for by the fact that two quizzes and a lesson on APA citation standards were added to the online training between the two pilots.

The answers to question 3 are more informative. In the first pilot study the online lessons were clear to the students, except the lessons on choosing a database and retrieving documents respectively. After some adjustments and in a situation in which the assignments were integrated in the course, all the lessons were clear. Students experienced only some difficulties with the lesson on document retrieval. These difficulties may have been caused by the complexity of the subject matter. Even experienced researchers may have some trouble retrieving documents and may need assistance from librarians.

Table 2. General answers to some of the evaluation questions concerning the two pilots.

	Public Administration (30 students)	Psychology (29 students)
1. How much time did you spend on the assignment and the online training in Information Literacy?	Average: 4.3 hours	Average: 9 hours
2. How much time did you spend to take the online training in Blackboard?	Average: 1.2 hours	Average: 2 hours
3. Were the following lessons clear to you?		
- Introduction	Clear	Clear
- Building a search profile	Clear	Clear
- Choosing a database	Unclear/clear	Clear
- Searching	Clear	Clear
- Selecting and evaluating	Clear	Clear
- Retrieving documents	Unclear	Unclear/clear
- Personal information maintenance	Clear	Clear
- Examples used in the course	Clear	Clear
- Interaction in the 'searching' part	Clear	Clear
- Interactive overall quiz	-	Clear
- Quiz on APA citation rules	-	Clear
4. Was the presentation in the computer lab a useful element of the course?	Yes: 9	Yes: 18
5. Do you expect to be using this information again in future assignments?	Yes: 18	Yes: 26

In the second pilot study, about two thirds of the number of students appreciated the presentation in the computer lab that was given just before they started working on their assignments and taking the online training (question 4). Furthermore, according to the pilot study, almost all students indicated that they expected to use the online training material again in future assignments in their curricula.

In the questionnaire, the students were asked about the complexity of the assignment. In the first pilot study the students reported some difficulties with the part of the assignment in which they were meant to find an article and the part in which they had to search the SSCI. In the second pilot study the students indicated having trouble searching for much-cited authors. Apparently, students still have some problems with the complexity of search processes. The only way to solve these problems is to practise. Since searching information is an important part of conducting scientific research, students interested in research activities should come across many opportunities to practise their searching skills in the course of their studies.

The students did not experience many technical problems. Blackboard is a user-friendly environment that most of them are familiar with. The few technical problems that were experienced had to do with accessing the databases via cable.

All in all, the students in the second pilot study were relatively positive about the assignment and online training in Information Literacy. (This question was not included in the questionnaire of the first pilot study). Students liked the mixed format used in this training and considered it a useful and practical way to learn about information management.

## 5 General conclusion

Information literacy is a crucial factor in renewing our educational programmes. It creates new possibilities for professors, such as the introduction of problem-oriented projects in which students are challenged to solve problems using literature and other types of resources. Another possibility is involving students in the organization of a symposium or congress. They have to give an overview of the state-of-the-art in a particular field and to trace the relevant people for the subject. Gradually, the educational process is changing from prescribed learning paths and materials to situations that appeal to the creativity of students. Portfolio is another example of a new instrument used to assess students, in which they have to make use of our (digital) information environment.

## **6 Future developments**

Information Literacy is becoming very successful. In some faculties, professors regard information literacy to be so important that we are requested to offer training throughout the course of the study, during every stage in which the information load is high. We are, however, faced with the issue of time, or rather the lack of it. Even though we cooperate with the teachers who give the training themselves, the part handled by the University Library is still very time-consuming.

It is important to structure the training in modules, so that you may choose the modules that are required for a specific topic in the curriculum. The course can be adapted to become more general or, on the other hand, focus on a specific part of the study, for instance for students who have to present a business plan. The courses are presented in Blackboard, but the form and the educational content are open for discussion within the faculty staff. Law students may take the Information Literacy course before writing a paper about a case. They will have to know all the relevant rules and jurisprudence as well as the legal history related to the case, so our training focuses on those aspects.

In the end students are trained to conduct and evaluate searches to help them to keep up with the developments in their fields, to recognize new trends and to formulate new research questions.